

FIG.1

(A)

(B)

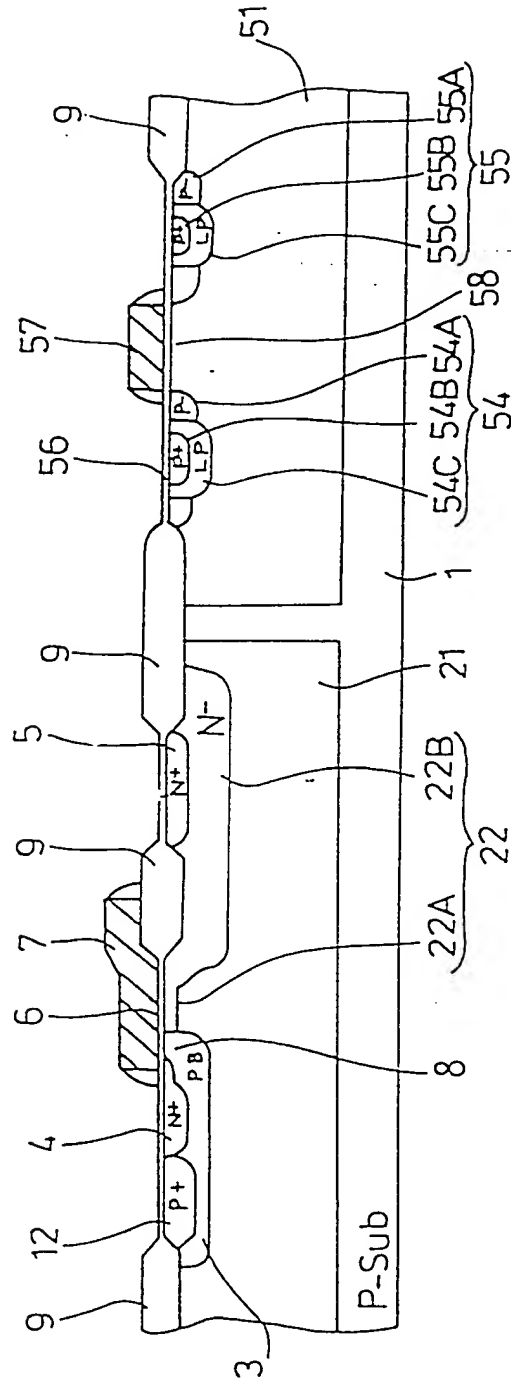
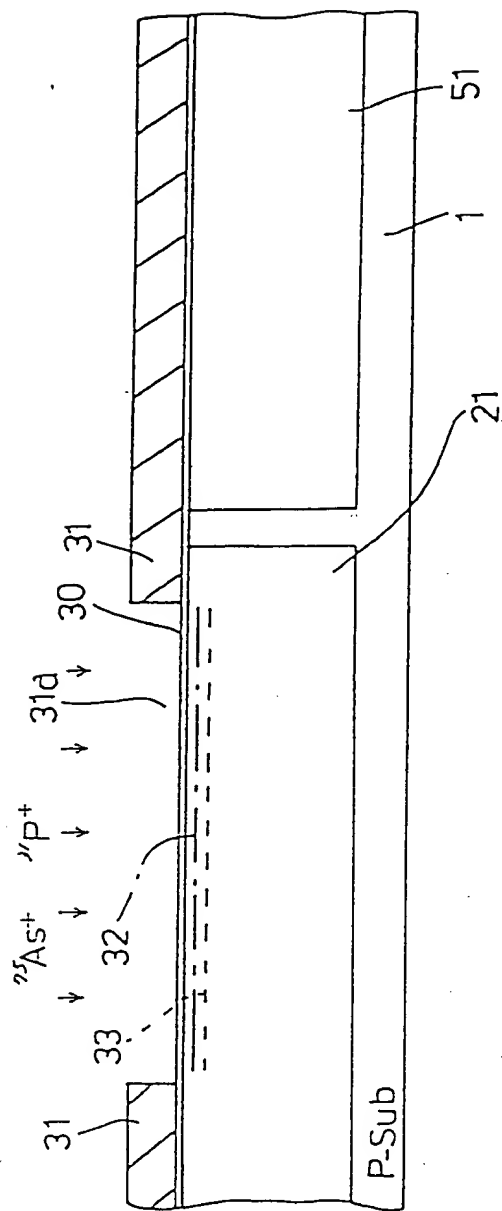


FIG. 2A



(A)

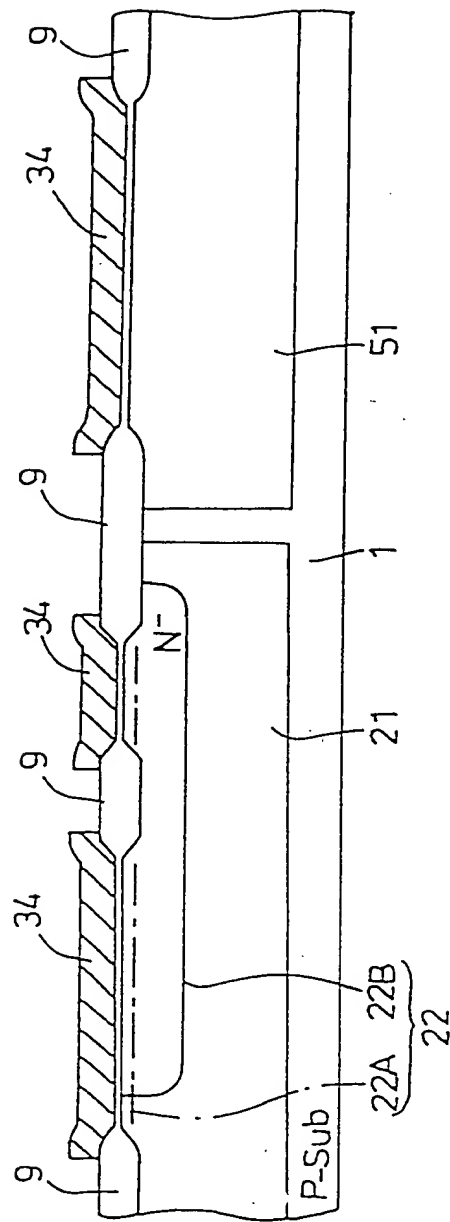


FIG. 2B

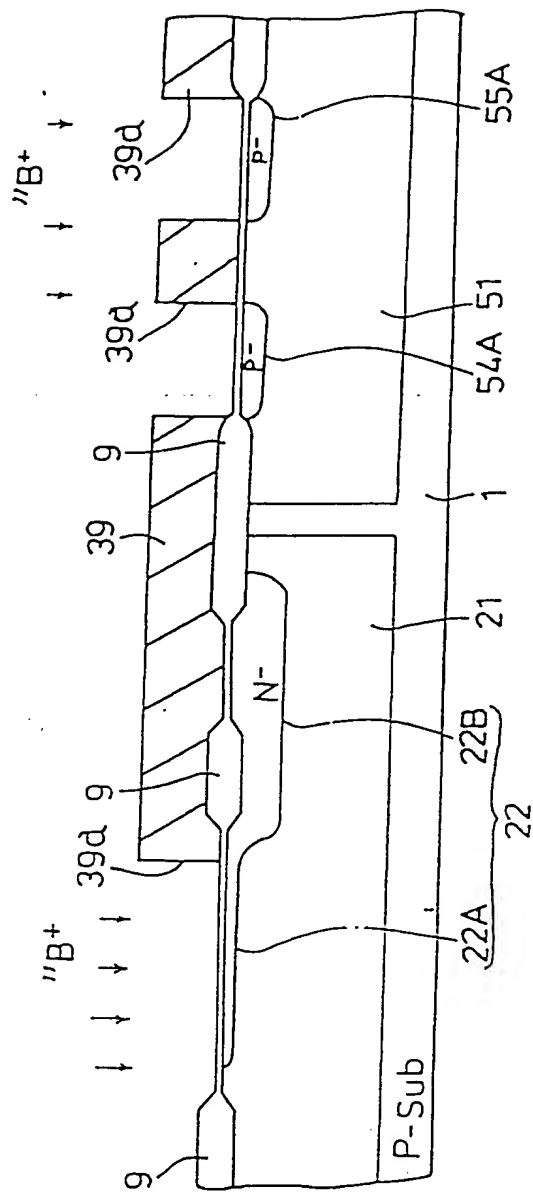


FIG. 3A

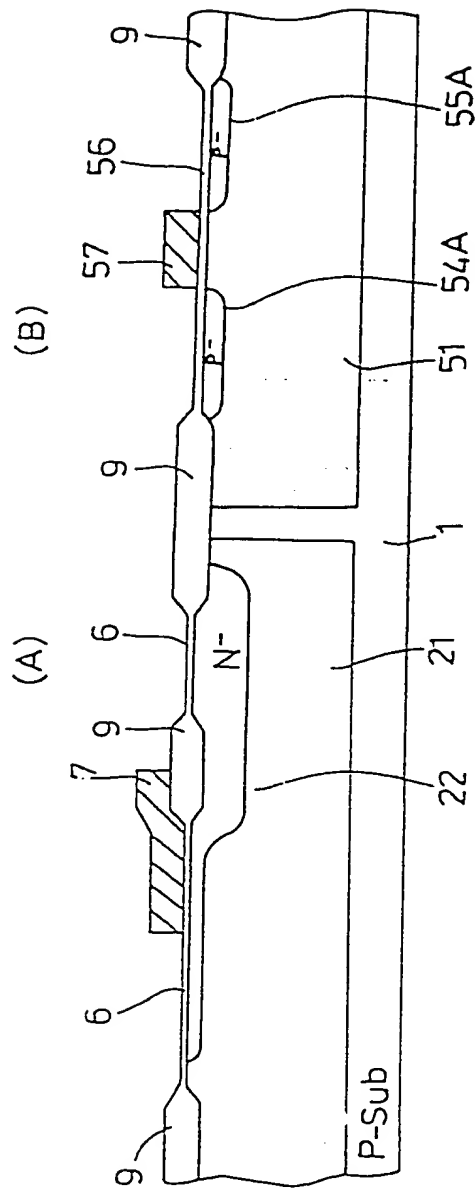


FIG. 3B

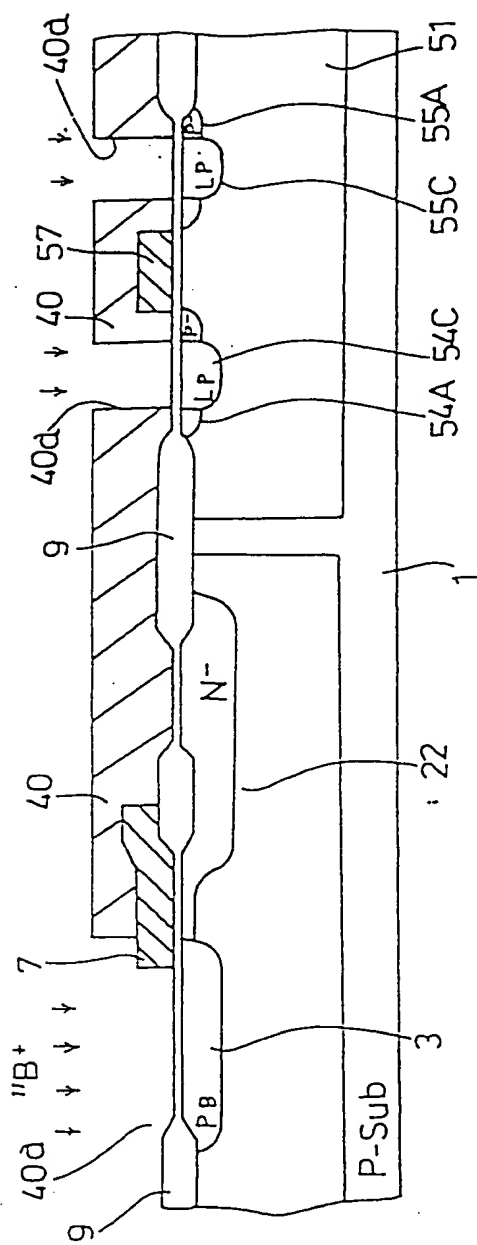


FIG. 4A

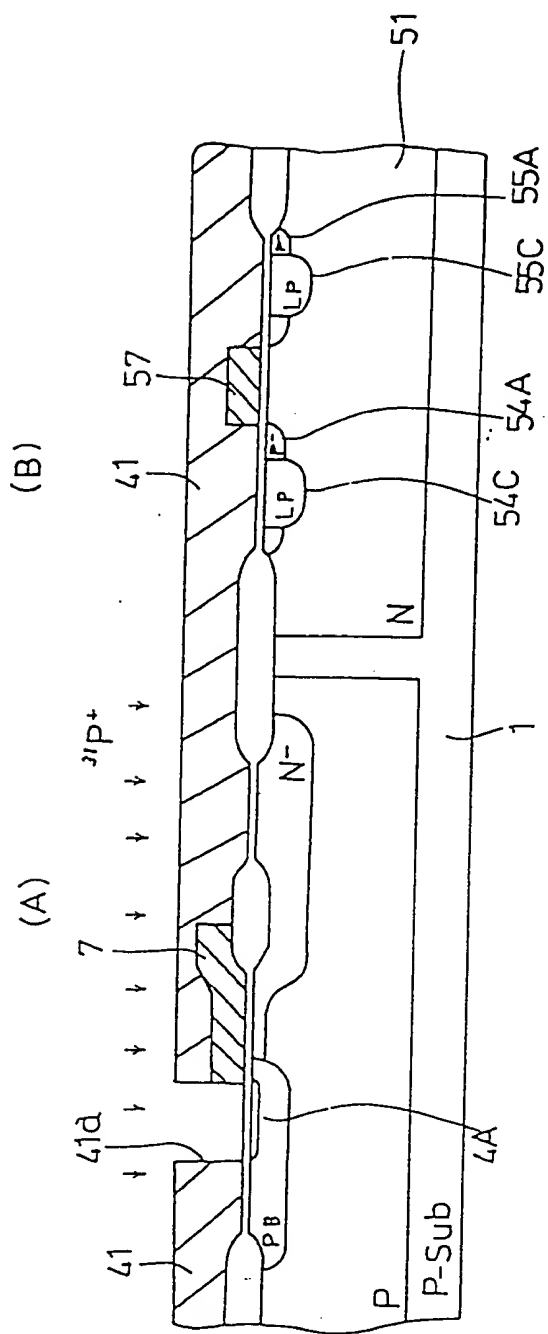


FIG. 4B



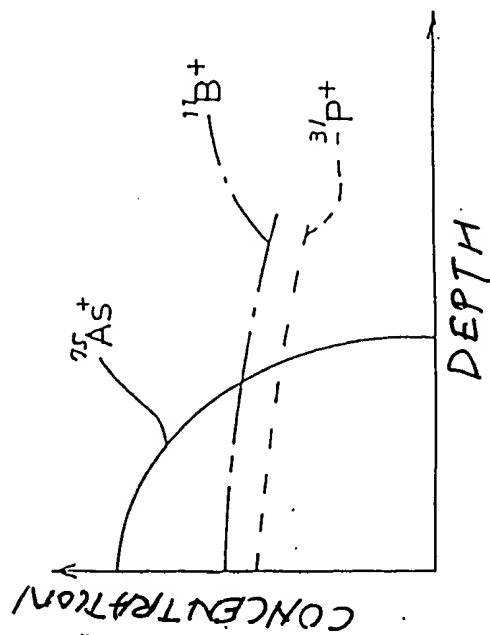


FIG.6

(A)



FIG. 8

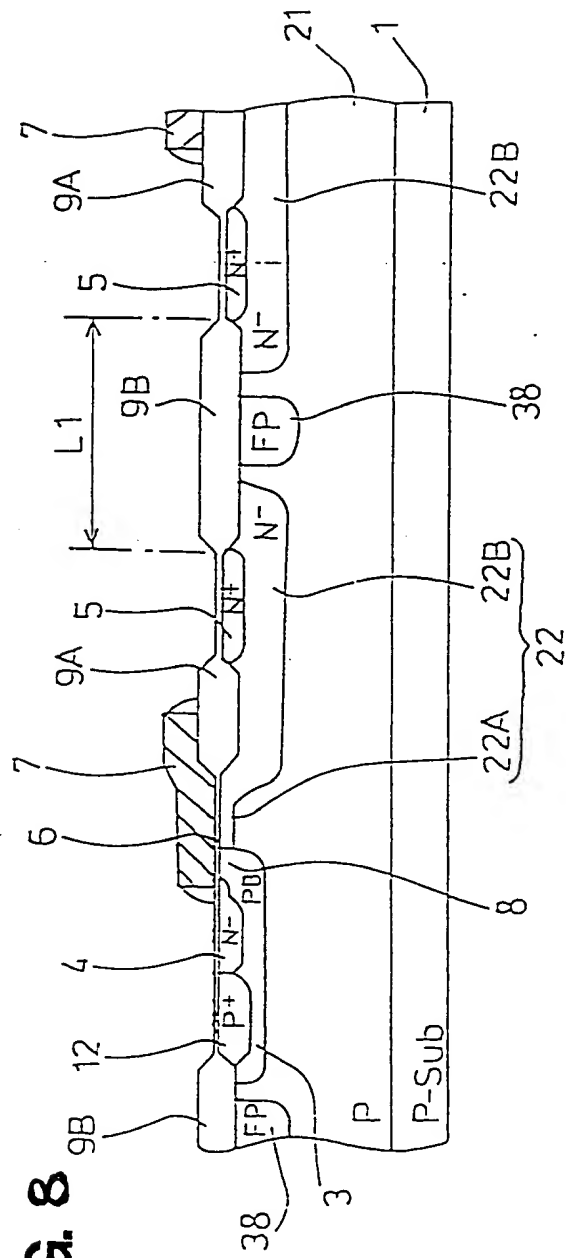


FIG. 9

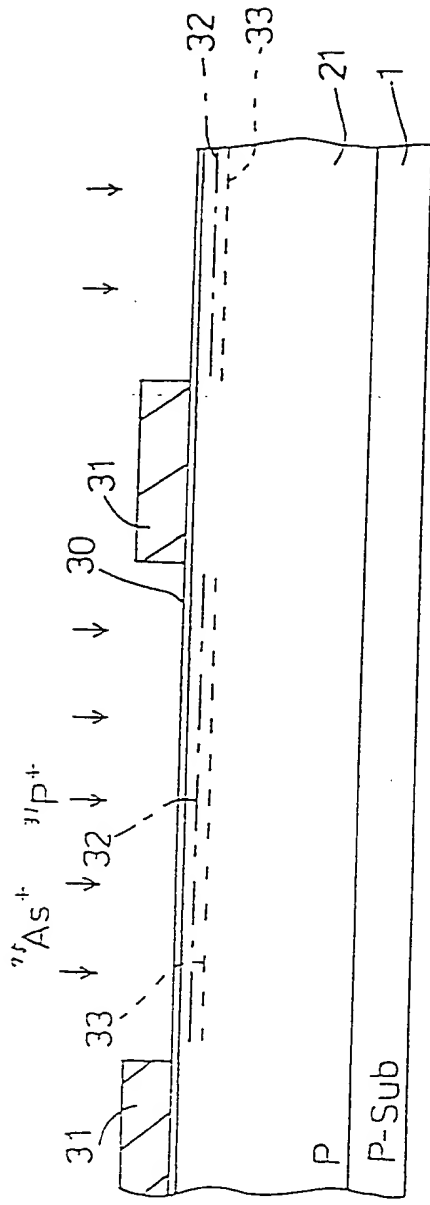


FIG.10

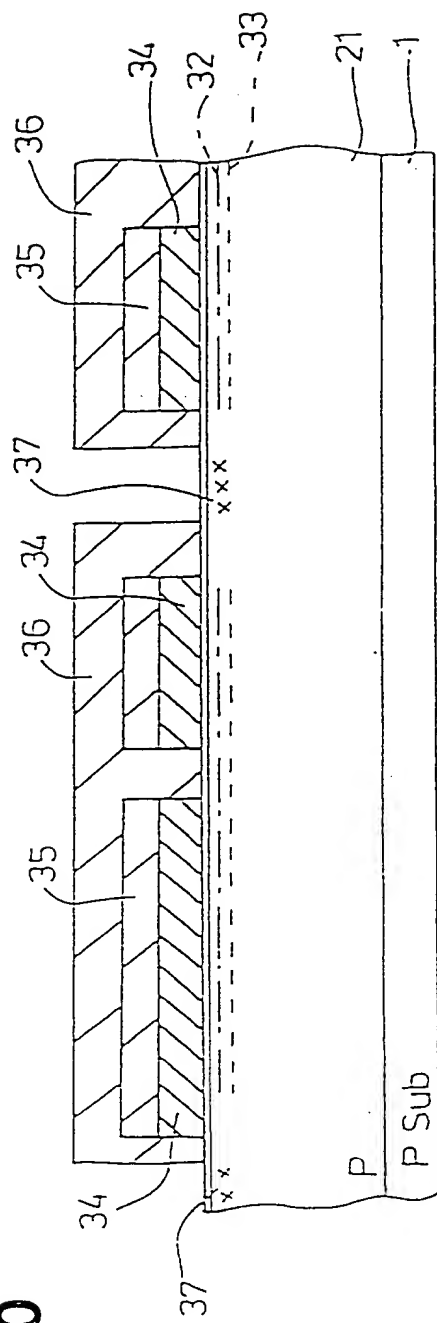


FIG. 11

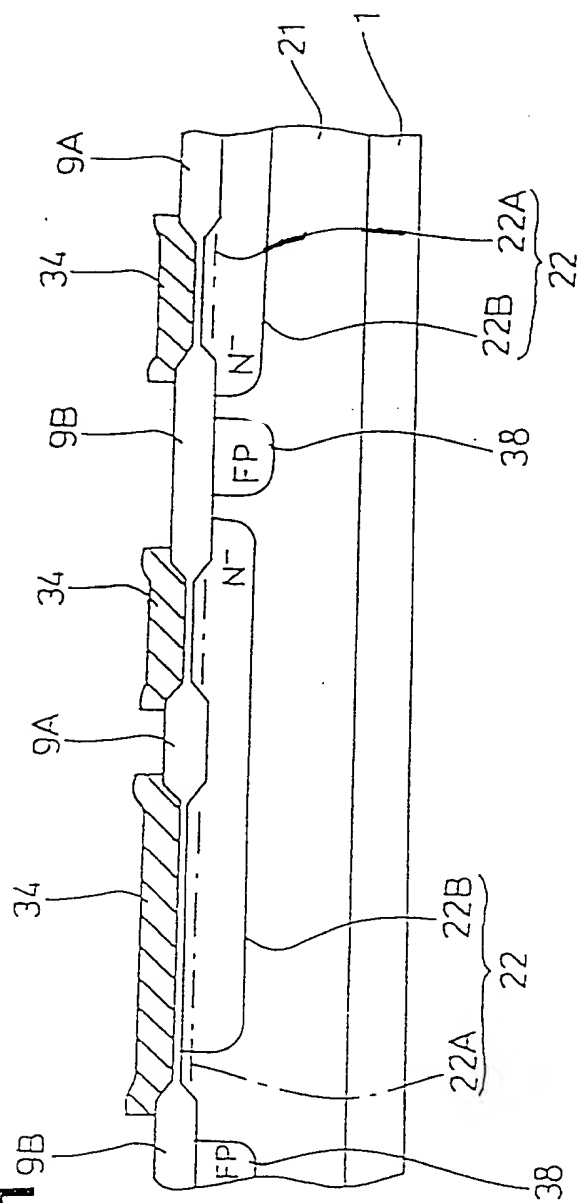


FIG.12

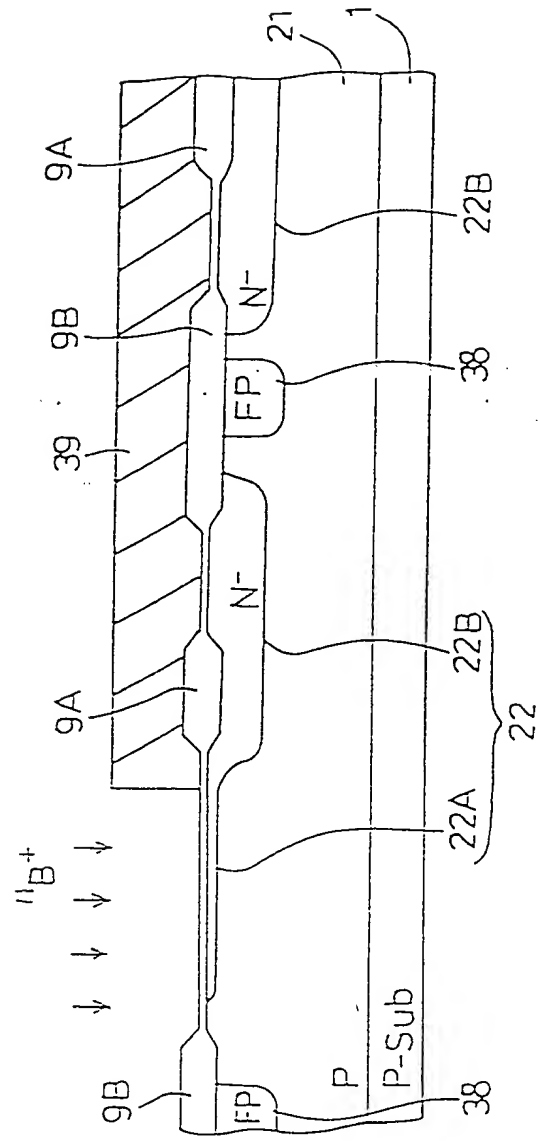
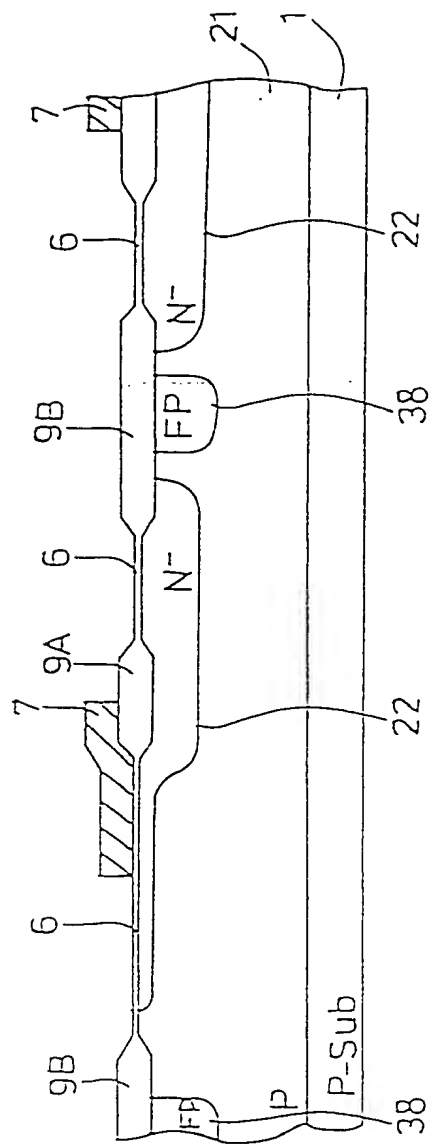
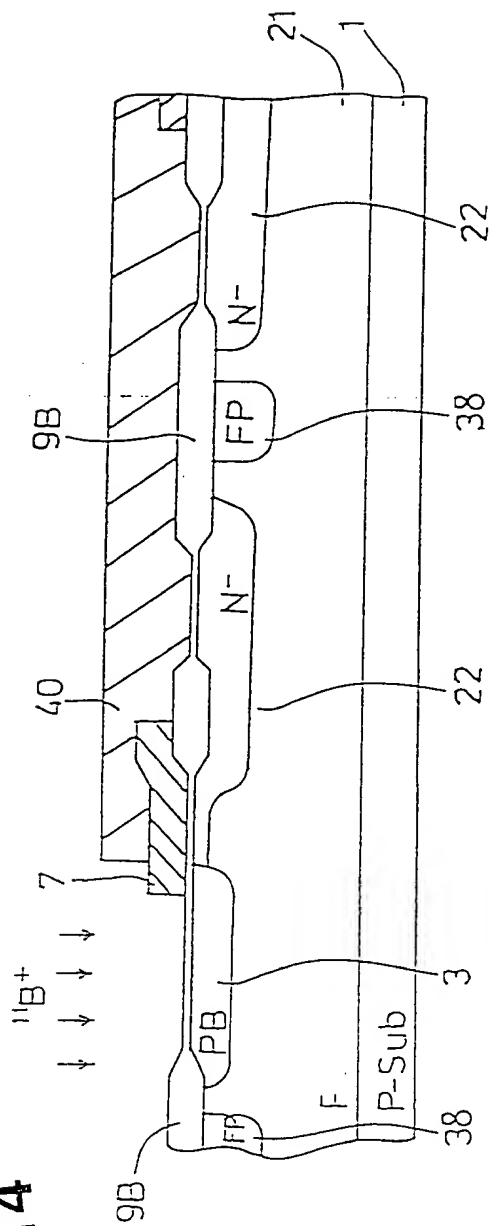


Fig. 1 is a cross-sectional view of a semiconductor device. The device is built on a substrate consisting of a P-Sub layer, a P layer, and an FP layer. The P-Sub layer is the bottom-most layer, followed by the P layer, and then the FP layer. Above the FP layer, there are several layers and regions: a layer labeled 6, a region labeled N-, a layer labeled 9A, a layer labeled 9B, and a layer labeled 21. The layers 6, 9A, and 9B are shown as thin, horizontal layers. The N- region is a larger, shaded area. The layer 21 is the top-most layer. The device is shown in a cross-section, with the layers and regions labeled with numbers and letters.





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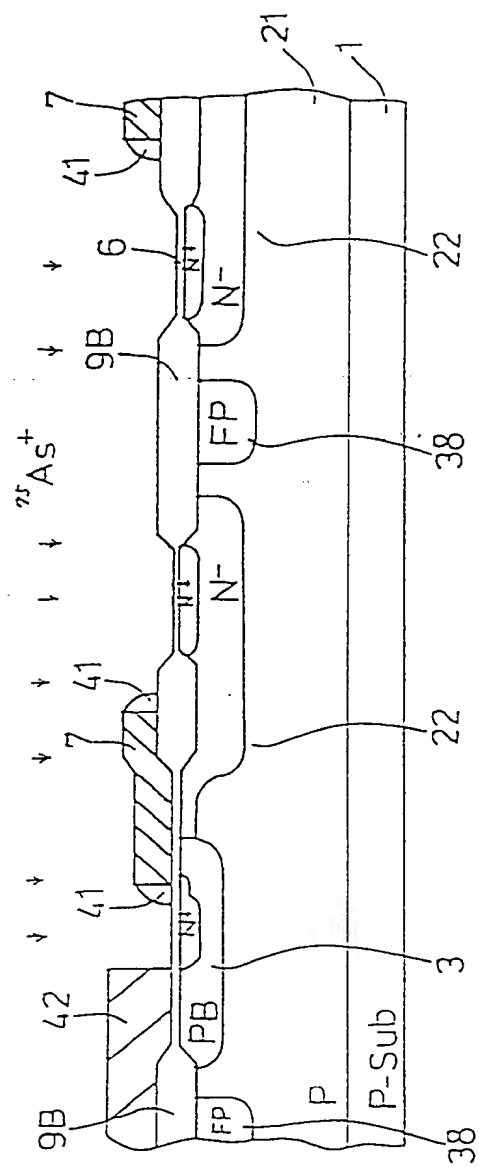


FIG.16

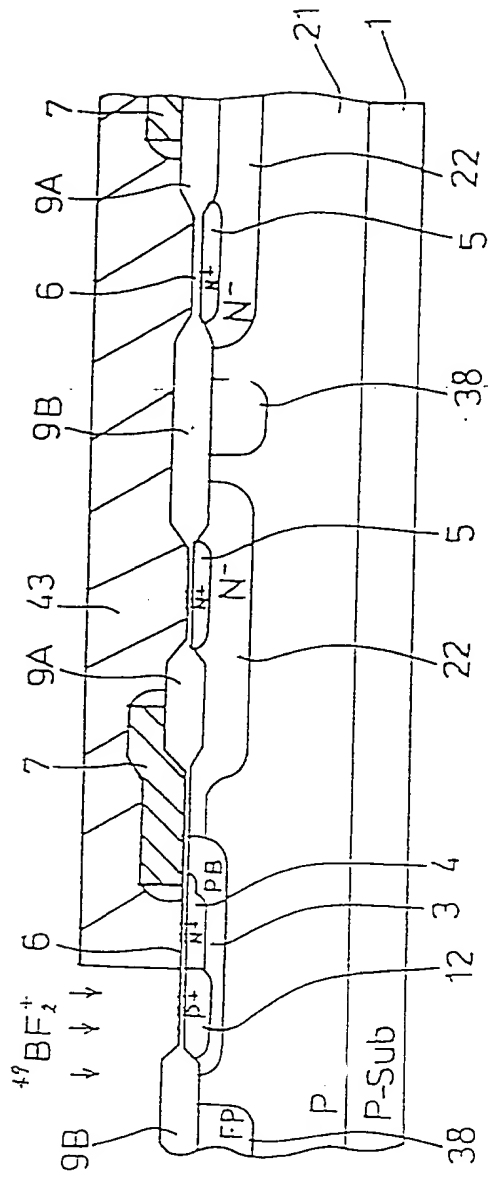


FIG.17

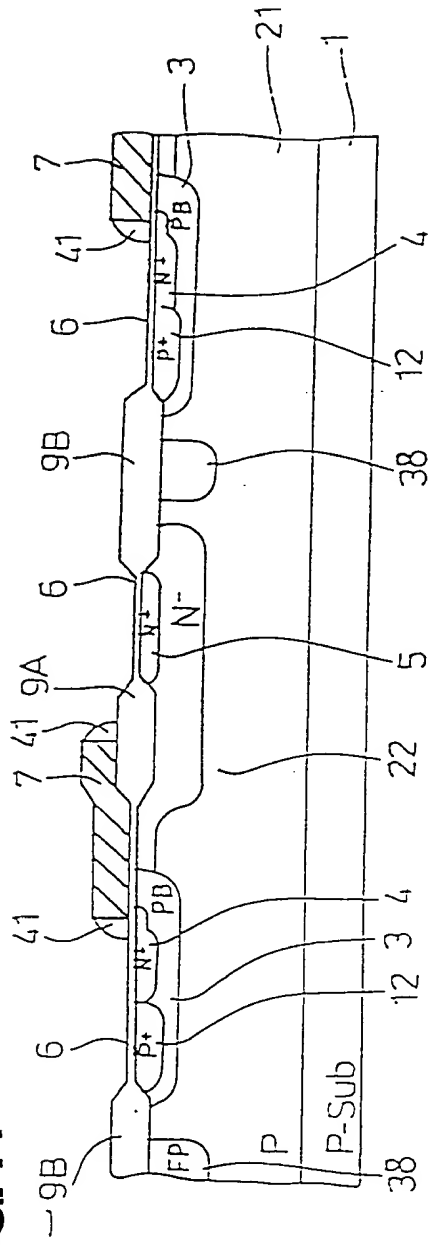




FIG. 18

FIG.19A

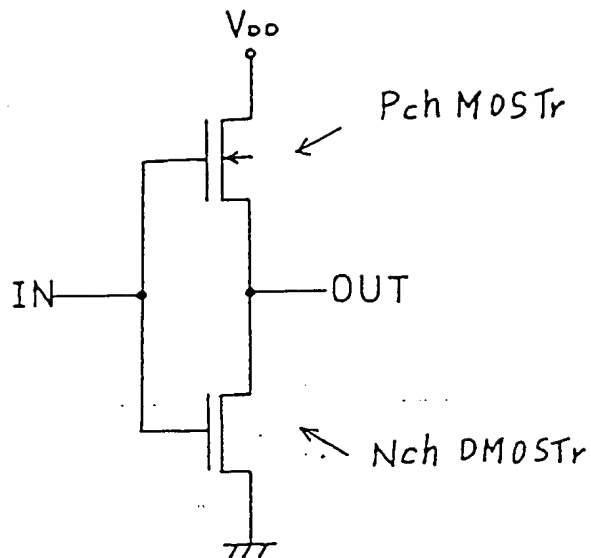
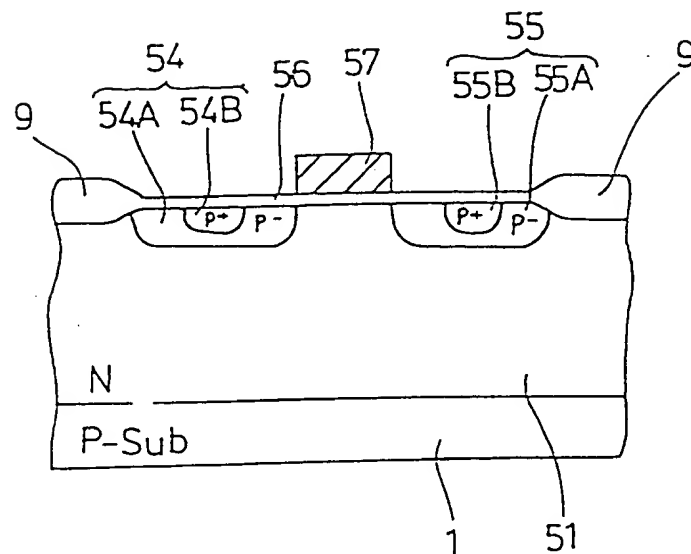
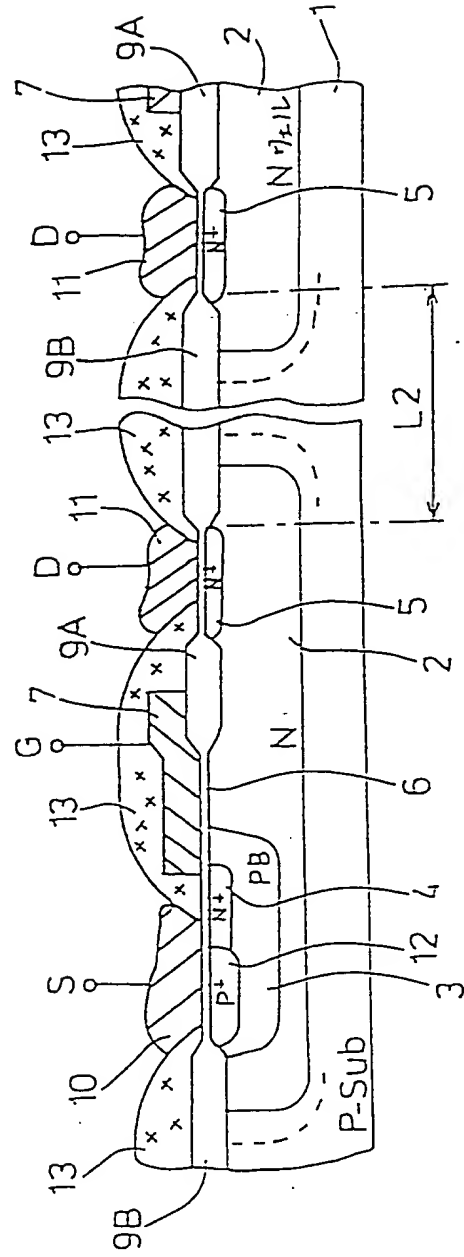


FIG.19B



This diagram shows a cross-sectional view of a semiconductor device with two gates, G and D, positioned above a P-Substrate (P-Sub). The device consists of several layers: a P-Sub layer (1), a P+ layer (2), an N+ layer (3), an N layer (4), an N+ layer (5), an N layer (6), an N+ layer (7), an N layer (9A), an N layer (9B), an N layer (10), an N layer (11), an N layer (12), an N layer (13), and a P-Sub layer (14). The gates G and D are located above the N+ layer (3) and N layer (4) respectively. The device is divided into two regions by a dashed line, with a length L2 indicated for the right region. Various other layers and regions are labeled with numbers 1 through 14.



Clamp Voltage vs Na Concentration

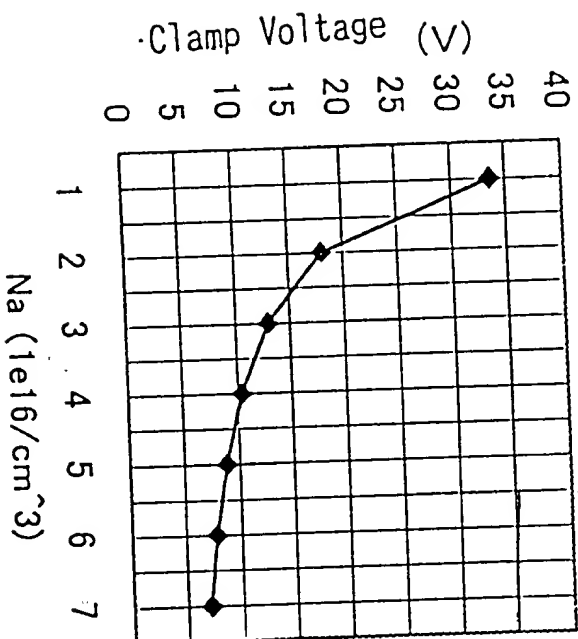


FIG.21

N—Clamp Voltage vs Na Concentration

Stepped Junction N—Concentration $1 \times 10^{17}/\text{cm}^3$

$X_j = 0.2 \mu\text{m}$

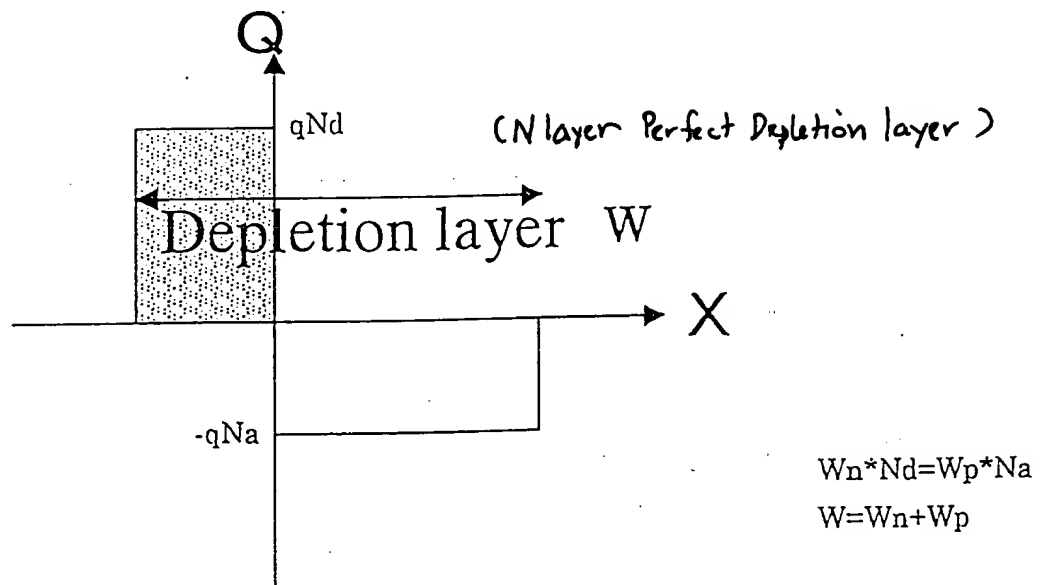
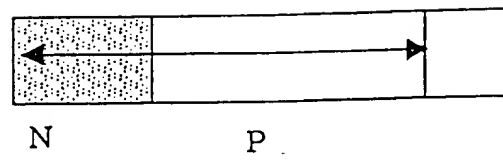


Fig.22 Stepped Junction